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TOWN OF MIDLAND - 1966
COUNTY OF SIMCOE

THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

of the

TOWN OF MIDLAND

COUNTY OF SIMCOE

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Report on a water pollution
survey of the town of Midland,
county of Simcoe.

80886

Report

on a

Water Pollution Survey

of the

TOWN OF MIDLAND

County of Simcoe

September 1966

Division of Sanitary Engineering

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R E P O R T

THE ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

This report is concerned with the assessment of water quality within the Town of Midland. Surveys of this nature are made by the Ontario Water Resources Commission for the purposes of locating and recording sources of existing and potential water pollution. When these sources are noted, recommendations pertaining to their abatement are made to the parties concerned. Where pollution problems are of a municipal nature, the OWRC advises municipalities concerning their needs for sewage treatment and disposal, and is prepared to construct, finance, and operate water and sewage works for Ontario municipalities upon request.

On May 11, and 22, 1966, samples were collected from surface waters within the municipality as well as from certain discharges thereto to obtain information concerning existing conditions with respect to water pollution. In addition, sample results which have been accumulated from past investigations are used in the report. The appendices include an interpretation of the laboratory analyses, the results of samples collected, and a map of the town showing the sampling point locations.

GENERAL

(1) Location

The Town of Midland is located in the County of Simcoe on

the south shore of Georgian Bay near its eastern extremity. Due to its location, it is a Great Lakes Shipping Port; the main product being handled is grain. The 1965 assessed population was 9,997 according to the 1966 municipal directory.

(2) Drainage

All surface water and storm drainage flows towards Midland Bay. A system of combined storm and sanitary sewers is presently in use. However, a programme of separating storm and sanitary flows is being carried out.

(3) Development

Midland is presently experiencing considerable industrial development which is expected to continue for some time. This growth is creating increased demands on the water supply and sewage disposal system. Proposals for increasing the water supply and sewer system are being considered. These expansions are referred to in the section dealing with the municipal water works and sewage disposal systems.

WATER USES

(1) Municipal Water Works

(a) Existing System

Water is obtained from five wells and two surface-water collection reservoirs. The reservoirs are supplemented with water pumped from Midland Bay. Four of the wells are located in a water collection area near the reservoir and the fifth is located behind the main pumphouse. The water is collected in a flume from where it

flows by gravity to the main pumphouse reservoir. It is chlorinated at the main pumphouse and pumped directly to the distribution system. Distribution storage consists of a 157,000 gallon standpipe and a 209,000 gallon elevated tank.

The built up area of the town is completely serviced with water mains. Extensions to certain outlying areas within the corporation limits are also being made. A generally satisfactory quality of the treated water has been apparent in the past.

(b) Proposed Enlargement

From the years 1955 to 1965, the total yearly water consumption has increased from approximately 250 million gallons to 400 million gallons resulting in a water shortage problem. Although area ground-water potential has been studied, surface water is regarded as the ultimate source. Since it became apparent that the town would be unable to supply the new RCA Victor Limited plant with a sufficient quantity of water it was decided that RCA would build its own water system. This system, using Midland Bay as a source of supply will have a capacity of approximately 2.0 mgd comprising a bay intake, low lift pumping station, supply main, and filtration and chlorination equipment. To assist the town water shortage problem, arrangements are to be made to purchase surplus water from RCA until the town's supply is increased.

(2) Industrial Water Works

The majority of the industries within the town are served

by the chlorinated municipal supply. However, another raw water system is maintained by the town and supplies Midland Industries Limited and the Bausch and Laumb Optical plant. A total of approximately 25 million gallons is pumped to the two industries per year.

The Decor Industries plant has its own raw water supply and uses approximately 100,000 gpd from this system. In addition, approximately 30,000 gpd is obtained from the municipal system.

(3) Private Water Supplies

A few private wells exist in the recently annexed areas of the town.

Waggs Laundry and Dry Cleaners Limited uses a well water supply in addition to municipal water.

(4) Recreational Water Use

Midland does not have any public swimming pools at the present time; the local Y.M.C.A. has proposed the building of such a pool.

Midland Park Lake is the focal point of summer recreation at Midland. The water quality aspects of this lake are discussed later in the report.

Swimming is also practised to a certain extent at various areas in Midland Bay.

WATER POLLUTION

(1) Water Pollution Control Plant

(a) General

The primary type water pollution control plant is operated

under the supervision of the OWRC Division of Plant Operations. The plant receives combined storm and sewage flows and discharges a seasonally chlorinated effluent to Midland Bay. The following pertinent design details are noted.

Population - 12,500
 Per Capita Flow - 100 gpd
 Design Plant Flow- 1.25 mgd
 Maximum Flow - 5.0 mgd
 Objectives - BOD Removal - 40%
 - S.S. Removal - 60%

(b) Plant Operation Efficiency and
 Effects on Midland Bay

The plant receives flows from approximately 8,000 persons or 80 per cent of the town population. During the latter months of 1965, the average daily sewage flow was approximately 55 per cent of the design capacity. Apparently, problems have been encountered with large quantities of grit being received at the plant during periods of storm flow. As previously mentioned, the municipality is in the process of separating storm and sanitary flows.

Below are the results of samples collected during 1965 and 1966 which indicate the treatment efficiency of the plant.

Sampling Date	Raw Sewage		Final Effluent		% Removal	
	BOD	S.S.	BOD	S.S.	BOD	S.S.
Jul.26/65 (composite)	195	185	74	104	-	-
Sept.14/65 (grab)	120	128	50	71	-	-
Nov. 17/65 (composite)	64	128	26	50	-	-
Jan.12/66 (composite)	88	155	55	54	-	-
Jan.26/66 (grab)	170	138	120	71	-	-
Feb.21/66	250	316	64	83	-	-
Apr. 4/66	106	100	46	34	-	-
Averages	141	164	62	66	56	60

It can be seen that the expected BOD and suspended solids removal objectives for a primary treatment plant are being attained. Although a high coliform count was noted in the sample taken from the plant outfall sewer on June 22, 1966, the samples collected from Midland Bay near the plant outfall revealed satisfactory coliform counts as well as satisfactory BOD, suspended solids, and nitrogen values. These sampling points are designated on the appended map as MB-1, MB-2, and MB-3.

(2) Municipal Storm Sewers

(a) General

There are four combined sewer outfalls to Midland Bay with the main outfall located at the foot of William Street. The storm sewer receiving industrial waste flows from the Pillsbury Canada Limited plant discharges to Midland Bay and is designated as MB-4W. The one storm sewer outfall to Midland Park Lake did not have any flow on May 11 and 22, 1966.

(b) Pollution Sources

At sampling points MB-1-W, MB-2-W, and MB-3-W, fairly high coliform counts were obtained. This is not unusual in a combined sewer system. The quality of the discharges from these outfalls should improve as the separation of the storm and sanitary flows proceeds.

The sample collected from the manhole upstream from the Pillsbury discharge (sampling point MB-4-W) did not indicate the

presence of any excessive waste concentrations.

(3) Private Sanitary Waste Outfalls

A number of sanitary waste outfalls which flow directly to Midland Bay exist in certain premises along the bay shore. These premises are listed below.

<u>Name of Premises</u>	<u>Remarks</u>
Great Lakes Boat and Machine Company	Three washrooms serving 15 employees with facilities discharging to a tank and thence to an adjacent boat slip.
Midland Grain Elevator	Four toilets serving 14 employees discharging directly to Midland Bay.
Midland Aberdeen Elevator Company	Two washrooms serving seven employees. Facilities in the office discharge to a septic tank and tile bed. Facilities in the shop discharge directly to Midland Bay.
Tiffen Elevator Company	Facilities include three toilets serving 27 employees and discharging directly to Midland Bay. The company has ordered the necessary equipment for the construction of septic tank and a tile bed system.
Public Washrooms	Mens and Ladies washrooms located on the main dock with a direct discharge to Midland Bay.
Snack Bar	Snack bar located on the main dock discharges wastes from a utensil washing sink to Midland Bay.

These waste outfalls should be eliminated either by establishing adequate subsurface disposal methods, or securing a connection to the municipal sanitary sewer.

(4) Industrial Waste Disposal

(a) General

The following industries are located in Midland.

<u>Firm Name</u>	<u>Product</u>
Bausch and Laumb Optical Company Ltd.	Lenses
Bay Mills Limited	Textiles
Decor Industries	Appliances and Auto Trim
Dominion Electroplating	Plating
Greening Wire and Rope Co. Ltd.	Wire and Cable
Fabulous Formals	Dresses
Furnitex Corporation Ltd.	Furniture
Kindred Industries Ltd.	Stainless Steel Kitchen Equip.
Arthur S. Leitch Co. Ltd.	Pumps
Ernest Leitz (Canada) Ltd.	Cameras and Optical Goods
Glen Manor Frocks Limited	Dresses
Midland Foundry and Machine	Steel Castings
Midland Industries Ltd.	Shoes, Plastics
Midland Planing Mills	Building Supplies
Pinecrest Products Ltd.	Furniture
Pillsbury Canada Ltd.	Flour, Cake Mixes
RCA Victor Company of Canada Ltd.	Television Sets
Webster Smallwood Limited	Fibre Glass Products

Any industrial or sanitary wastes which may be discharged from most of the above industries are directed to the municipal sanitary sewer. The following exceptions which are noted presently are receiving attention concerning the revision of their waste disposal measures by the officials concerned.

(b) Pollution Sources

Pillsbury Canada Limited - operates a large flour processing

mill together with a special products division known as the mix plant. At the mix plant, packaged cake and pie mixes as well as various refrigerated ready-to-bake products are manufactured.

All wastes, industrial and sanitary, are discharged to Midland Bay via two sewer discharges, i.e., the grain washing water discharge from the mill building designated on the appended map as MB-2-I, and the sanitary waste, and industrial waste resulting from the washdown of the process machines and floors which are discharged to the municipal storm sewer. This outfall is designated on the map as MB-4-W. The concentrations of BOD and suspended solids for both discharges are in excess of the recommended OWRC objectives for discharge to a watercourse.

The Industrial Wastes Division of the OWRC has made recommendations to the company concerning the segregation of contaminated wastes from cooling water and pumping them to the sanitary sewer system. This is presently being acted upon.

Decor Industries - formerly known as Canadian Name Plate Company Limited operates a large plating and manufacturing plant on the shore of Midland Bay. All industrial wastes are discharged to Midland Bay via five separate sewers. These are designated on the appended map as MB-1-I.

The sources of industrial waste are:

1. Rinse waters from the plating, etching, and anodizing rooms.

2. Rinse waters from the tumbling area.
3. Intermittent rinse waters from the tumbling area.
4. Boiler blowdown.
5. Cooling water from the extrusion and glass cutlery machines; also some roof drainage.

As the appended sample results indicate, an unsatisfactory industrial waste effluent is being discharged to Midland Bay.

The Industrial Wastes Division of the OWRC has made recommendations to the company concerning the waste problems and revised methods are presently being considered.

Kindred Industries Limited - discharges cooling water to a road ditch which has its outfall to the Wye River at sample point No. W-1.0-D. A sample collected at this point on June 9, 1966 revealed satisfactory BOD, suspended solids, and coliform concentrations.

(5) Watercraft

(a) Great Lakes Vessels

The Great Lake freighters docking at Midland are mainly grain carriers. During the summer, about one boat per week may arrive at the docks, while during the winter months, as many as ten may be tied up for the season.

In the past, pollution problems have resulted at times from the disposing of garbage by the ships crew, or the discharging of oil directly into the water. However, the local health unit has maintained an active observation and control programme concerning these

types of offences, resulting in occurrences of this nature becoming less common.

(b) Pleasure Craft

Numerous pleasure craft utilize the various docking facilities in Midland Bay. Undoubtedly, these craft do at times contribute to water pollution by the discharging of sanitary wastes directly into the water. The town officials have been considering the use of an inductor to pump sanitary wastes from pleasure craft to the town sewers. This would appear to be a practical solution and merits further consideration.

(6) Midland Park Lake

(a) General

A large park operated by the Midland Park Commission is situated on this lake. In addition to the towns people, many tourists utilize the park facilities and swim in the lake. Reportedly, about 150-200 cars per day may enter the area on a weekend.

The lake is spring fed and has no outlet. It is about 1.25 miles long, 0.67 miles wide, and is approximately 13 feet deep at its deepest point. The lake level can be controlled by a weir system which permits the drainage of water to a storm sewer. The shoreline other than the swimming area is dotted with cottages.

(b) Water Quality

Records of samples collected from the lake by the health unit indicate that no serious degree of pollution has been noted.

The appended results of samples collected show counts which are well within the OWRC objectives for surface-water quality.

(7) Refuse Disposal

A site located west of the town in Tiny Township is used for the disposal of refuse. The operation at this site does not appear to be creating any problems associated with water pollution.

GENERAL DISCUSSION OF LABORATORY RESULTS

With the exception of a relatively high coliform count at one sampling point in Midland Bay, samples collected from Midland Bay and Little Lake revealed generally satisfactory results. The storm sewer outfall sample results reveal varying degrees of contamination in these discharges which is typical of a combined sewer system. Counts significantly in excess of OWRC objectives are apparent in the industrial waste discharges from the Pillsbury Canada Limited plant and the Decor Industries plant. The high coliform count was obtained in a sample collected from Midland Bay near the Pillsbury grain washing outfall.

SUMMARY

The purpose of this report is to assess conditions with respect to water quality within the Town of Midland.

Although the condition of surface waters within the town appear to be generally satisfactory, certain pollution sources do exist. The most significant of these are the industrial waste

discharges from the Pillsbury Canada Limited plant and the Decor Industries plant. Programmes have been initiated at both of these plants to revise their waste disposal methods.

A number of private sanitary waste outfalls exist at certain premises along the Midland Bay waterfront. These should be eliminated. A varying degree of contamination is evident in each storm sewer discharge. The quality of these discharges should improve as the programme of separating storm and sanitary flow progresses.

The water pollution control plant appears to be attaining its objective for the treatment of sewage before its discharge to Midland Bay.

Measures are being taken to minimize pollution from watercraft.

RECOMMENDATIONS

1. Pillsbury Canada Limited should continue its programme of establishing satisfactory industrial waste disposal measures.
2. Decor Industries should continue its efforts to provide adequate industrial waste disposal facilities.
3. Sanitary waste outfalls to Midland Bay from the aforementioned premises should be eliminated.
4. The programme of separating storm and sanitary waste flows should be accelerated as much as possible.

5. Provision should be made for the satisfactory disposal of wastes from boats docked at the Midland Harbour as already proposed by the municipality.

/elc

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EXPLANATION AND SIGNIFICANCE OF LABORATORY ANALYSES

A Bacteriological Examination

Bacteriological examinations were performed on samples from the watercourse. The Membrane Filter technique was used to obtain a direct enumeration of coliform organisms. These organisms are normal inhabitants of the intestines of man and other warm blooded animals. They are always present in sewage and are generally minimal in other pollutants. The results of the examinations are reported as M.F. Coliform count per 100 ml.

The Commission's objective for surface waters in Ontario is a coliform count of not greater than 2,400 organisms per 100 ml.

B Chemical Analysis

The chemical analysis performed on stream and outfall samples included determinations for biochemical oxygen demand and suspended solids.

(1) Biochemical Oxygen Demand (BOD)

Biochemical oxygen demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required for stabilization of decomposable organic matter present in sewage, polluted waters or industrial wastes. The completion of the test requires five days, under the controlled incubation temperature of 20°C.

The Commission's water quality objectives are (I) for stream water - a 5-Day BOD of not greater than 4 ppm. (II) for storm

sewer, water pollution control plant and industrial waste discharges - a 5-Day BOD of not greater than 15 ppm.

(2) Solids

The laboratory does tests to determine the total and suspended solids in a sample. The value for dissolved solids is determined by taking the mathematical difference between the total and suspended solids.

The concentration of suspended solids expressed in parts per million (ppm) is generally the most significant of the solids analyses in regard to stream water and outfall discharge qualities.

The OWRC's objective for discharge is a suspended solids concentration of not greater than 15 ppm.

TOWN OF MIDLAND WATER POLLUTION SURVEY

RESULTS OF SAMPLES COLLECTED FROM MIDLAND BAY AND WYE RIVER

TABLE I

SAMPLING POINT NO.	DESCRIPTION	DATE	5-DAY BOD (PPM)	SOLIDS			NITROGEN AS N				M.F. COLIFORM COUNT/100 ML
				TOTAL (PPM)	SUSP. (PPM)	DISS. (PPM)	FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	
W-1.0	WYE RIVER AT HWY. 12.	JUNE 9/66	4.0	254	12	242					500
MB-1	MIDLAND BAY.	JUNE 9/66	1.7	132	2	130					20
		JUNE 22/66	0.9	132	14	118	0.05	0.78	0.00	0.00	4
MB-2	MIDLAND BAY.	JUNE 22/66	1.2	124	12	112	0.03	0.33	0.00	0.00	<4
MB-3	MIDLAND BAY.	JUNE 22/66									<4
MB-4	MIDLAND BAY.	JUNE 22/66	1.5	128	13	115	0.12	0.71	0.00	0.00	116
MB-5	MIDLAND BAY.	JUNE 22/66	1.6	116	8	108	0.03	0.71	0.00	0.00	6,300
MB-6	MIDLAND BAY.	JUNE 22/66	9.6	196	38	158	0.02	1.50	0.00	0.05	432
MB-7	MIDLAND BAY.	JUNE 9/66	1.4	134	3	131					26
		JUNE 22/66	1.4	150	5	145	0.03	0.65	0.00	0.00	28
MB-8	MIDLAND BAY.	JUNE 22/66	1.2	140	4	136	0.05	0.33	0.00	0.00	44
MB-9	MIDLAND BAY.	JUNE 22/66	2.0	140	3	137	0.02	0.46	0.00	0.00	76
MB-10	MIDLAND BAY.	JUNE 22/66									8
MB-11	MIDLAND BAY.	JUNE 22/66									<4
MB-12	MIDLAND BAY.	JUNE 9/66	2.4	122	3	119					18

TOWN OF MIDLAND WATER POLLUTION SURVEY

RESULTS OF SAMPLES COLLECTED FROM DITCH AND SEWER DISCHARGE

TABLE II

<u>SAMPLING POINT NO.</u>	<u>DESCRIPTION</u>	<u>DATE</u>	<u>5-DAY BOD (PPM)</u>	<u>TOTAL (PPM)</u>	<u>SOLIDS SUSP. (PPM)</u>	<u>DISS. (PPM)</u>	<u>M.F. COLIFORM COUNT/100 ML</u>
W-1-O-D	DRAIN TO WYE RIVER SOUTH OF Hwy. 12.	JUNE 9/66	1.7	236	8	228	1,080
MB-1-T	WATER POLLUTION CONTROL PLANT OUTFALL.	JUNE 22/66	74	448	50	398	10,500,000
MB-1-W	STORM SEWER OUTFALL TO MIDLAND BAY AT FOOT OF WILLIAM STREET.	JUNE 9/66	6.0	226	65	161	30,000
		JUNE 22/66					152
MB-2-W	OVERFLOW FROM STORM AND SANITARY SEPARATOR TO MIDLAND BAY.	JUNE 22/66	1.5	252	5	247	137,000
MB-3-W	STORM SEWER OUTFALL TO MIDLAND BAY AT MAIN DOCK.	JUNE 9/66	6.4	202	95	107	77,000
		JUNE 22/66	2.8	200	7	193	84,000
MB-4-W	STORM SEWER MANHOLE AT PILLSBURY PLANT.	JUNE 22/66	4.4	278	70	208	120
MB-5-D	CREEK FLOWING TO MIDLAND BAY NORTH OF VINDIN ST.	JUNE 9/66	2.2	178	9	169	1,000

RESULTS OF SAMPLES COLLECTED FROM LITTLE LAKE

[illegible]

TOWN OF MIDLAND WATER POLLUTION SURVEY

RESULTS OF SAMPLES PERTAINING TO INDUSTRIAL WASTES FROM PILLSBURY CANADA LIMITED

TABLE IV

<u>SAMPLING POINT NO.</u>	<u>DESCRIPTION</u>	<u>DATE</u>	<u>5-DAY BOD (PPM)</u>	<u>TOTAL (PPM)</u>	<u>SOLIDS SUSP. (PPM)</u>	<u>DISS. (PPM)</u>	<u>M.F. COLIFORM COUNT/100 ML</u>
MB-4-W	MIX PLANT OUTFALL	AUG. 26/65	230	338	62	276	
MB-2-1	MILL BUILDING OUTFALL (COMPOSITE SAMPLE).	AUG. 26/65	240	644	222	422	
		JUNE 9/66	70	436	182	254	83,000

TOWN OF MIDLAND WATER POLLUTION SURVEY

SAMPLES PERTAINING TO INDUSTRIAL WASTES FROM DECOR INDUSTRIES

TABLE V

SAMPLING POINT NO.	DESCRIPTION	DATE	SOLIDS			PH AT LAB	CYANIDE		CHROME AS CR.		ALUMINUM	ZINC	IRON	SULPHATE	ETHER SOLUBLES	NICKEL	ACIDITY
			TOTAL (PPM)	SUSP. (PPM)	DISS. (PPM)		AS HCN		TOT.	HEXA.	AS AL.	AS ZN.	AS FE.	AS SO ₄		AS NI.	
T-2469	OUTFALL #1 (PLATING) (C. 12-1)	DEC.15/65	666	18	648	3.0	2.5		5.0	5.0	16.0	0.3	2.2	69	-	2.5	490
T-2470	OUTFALL #1 (PLATING) (C. 1-2)	DEC.15/65	622	12	610	1.9	7.9		8.0	5.0	14.0	2.7	13.5	84	-	5.1	1,480
T-2471	OUTFALL #1 (PLATING) (C. 2-3)	DEC.15/65	624	10	614	2.9	7.9		15.0	8.0	15.0	3.7	2.9	80	-	6.3	420
T-2472	OUTFALL #2 (TUMBLING) (C. 12-3)	DEC.15/65	1,434	158	1,276	**	-		4.4	4.4	**	**	12.6	39	15.0		
T-2473	OUTFALL #3 (BOILER) (C. 12-3)	DEC.15/65	1,526	102	1,424	10.0	-		-	-	6.5	0.0	4.9	193	-		
T-2474	OUTFALL #4 (EXTRUSION) (C. 12-3)	DEC.15/65	-	-	-	7.6	-		-	-	1.2	0.0	0.43	17	0		
T-2475	OUTFALL #2 (TUMBLING) (G. 2:00)	DEC.15/65	7,260	3,800	3,460	8.1	-		10.0	10.0	30.0	0.0	323	370	-		
T-2476	OUTFALL #2 (TUMBLING) (G. 2:00)	DEC.15/65	14,340	12,824	1,516	10.1	-		0.0	0.0	28.0	4.5	123	40	-		

C. COMPOSITE

G. GRAB

** NO SAMPLES AVAILABLE FOR THESE TESTS.

